

HINGED HOUSINGS FOR ELECTRONIC DEVICES

FIELD OF THE INVENTION

This invention relates generally to hinged housings and more specifically to hinged housings for electronic devices by which movably connected housing elements may be rotated into user-selectable positions.

BACKGROUND OF THE INVENTION

Many commonly known electronic devices utilize two housing elements which are movably connected by a type of hinge mechanism. The resulting arrangement of housing elements not only provides for a more compact electronic device, but also protects fragile components, such as switches or displays, which may be hidden when the electronic device is folded together. One example of a hinged electronic device is a wireless telephone having a microphone section that may be folded together with the main telephone section. Such a hinged telephone is typically more compact than conventional wireless telephones and, therefore, may be more conveniently carried by a user. Additionally, the telephone controls may be covered, and thus protected, by the microphone section when the telephone is folded into a closed position for carrying. When the telephone is to be operated, the microphone section is rotated into an open position typically at an obtuse angle to the main telephone section so that the user may listen via an ear piece located on the main telephone section and speak into the microphone.

Other electronic devices that commonly utilize a hinge mechanism are laptop computers. Laptop computers, which are designed to be very compact, usually employ a "flip-up" display section. When the display section is rotated into a closed position, the display and keyboard are concealed and protected from accidental breakage. Unlike conventional hinged telephones, however, when the display section is released from the closed position, it may be rotated into many different positions. In this manner, the user may conveniently adjust the display section to a preferred position in which it is held by compression forces within the hinging mechanism.

However, although both of the hinge mechanisms described above for the wireless telephone and the laptop computer provide for compact storage and protection of fragile components during storage, these hinge mechanisms are not designed for hands-free operation by a user who is to wear the electronic device and have it stabilized so that the user may actively use controls on the device. Moreover, these hinged electronic devices cannot be moved from a hands-free configuration into a table-top configuration for desktop use.

Another type of electronic device that is hinged and can be worn by a user is disclosed in U.S. Pat. No. 5,363,089 issued to Goldenberg for a data communication receiver. The receiver has a display device which is hinged at the bottom of a body portion secured to a user's belt. Rotating the display away from the body portion permits the user to read a message on the display. Because the display portion is hinged at the bottom of the body portion attached to a user, however, the body portion is pulled away from the body of the user and not well-supported when the display portion is opened. Although this drawback is not as great for data receivers which do not require operating many controls by a user, in the case of data input/output devices which have controls on the device, the lack of stability created by this hinged configuration becomes more severe.

The foregoing illustrates limitations known to exist in present hinged electronic devices. Thus it is apparent that it would be advantageous to provide an alternative directed to overcoming one or more of the limitations set forth above. Accordingly an alternative hinged electronic device is provided including the features more fully disclosed hereinafter.

SUMMARY OF THE INVENTION

According to the present invention, provided in a first embodiment is a hinged housing for an electronic device having a first body portion defining a first plane and having a surface with a control panel and a second body portion defining a second plane and having a mounting surface. The first and second body portions are pivotally hinged to rotate between a first position, in which said first plane and said second plane are at an obtuse angle, and a second position, in which the first plane and the second plane are oblique, such that in the second position the control panel is rotated at an angle greater than 180 degrees from the mounting surface. Provided in another embodiment is a hinged housing for an electronic device in which the first and second body portions are pivotally hinged to rotate between a first position, in which the first plane and the second plane are parallel, and a second position, in which the first plane and the second plane are oblique, such that in the second position the control panel is rotated at an angle greater than 180 degrees from the mounting surface.

The foregoing and other aspects will become apparent from the following detailed description of the invention when considered in conjunction with accompanying drawing figures.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a hinged housing utilizing a hinge mechanism in accordance with one embodiment of the present invention;

FIG. 2 is a side view of the hinged housing of FIG. 1 showing in phantom lines the range of motion between body portions of the hinged housing;

FIG. 3 is an isometric view illustrating a position in which the hinged housing of FIG. 1 may be set on a desk or table top in accordance with the preferred embodiment of the present invention;

FIG. 4 is an isometric view illustrating a position in which the hinged housing of FIG. 1 may be worn by a user in accordance with the preferred embodiment of the present invention;

FIG. 5 is a sectional side view of the hinge mechanism of FIG. 3 along line 5—5 in accordance with the preferred embodiment of the present invention;

FIG. 6 is a sectional side view of the hinge mechanism of FIG. 4 along line 6—6 in accordance with the preferred embodiment of the present invention;

FIG. 7 is a side view of a hinged housing in accordance with an alternative embodiment of the present invention showing in phantom lines the range of motion between body portions of the hinged housing;

FIG. 8 is a sectional side view of the hinge mechanism of FIG. 1 along line 8—8 in accordance with the preferred embodiment of the present invention; and

FIG. 9 is a sectional side view of the hinge mechanism of FIG. 1 along line 9—9 in accordance with the preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The invention is best understood by reference to the accompanying drawings in which like reference numbers